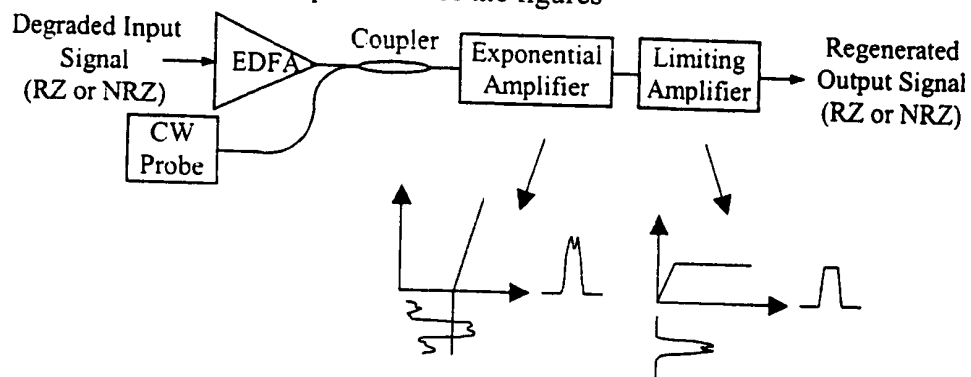All other figures and explanation of the figures

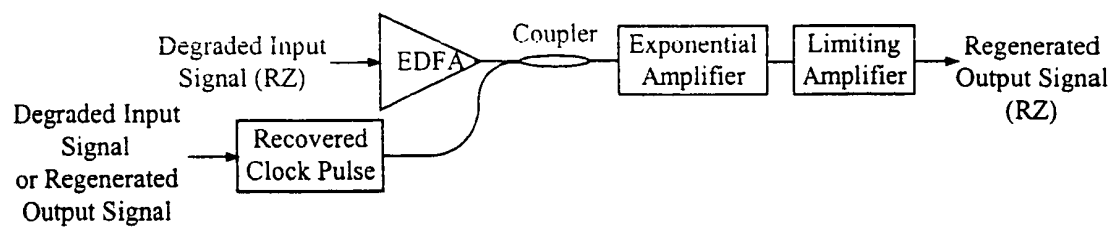Fig. 1. Schematic diagram for format insensitive 2R regeneration

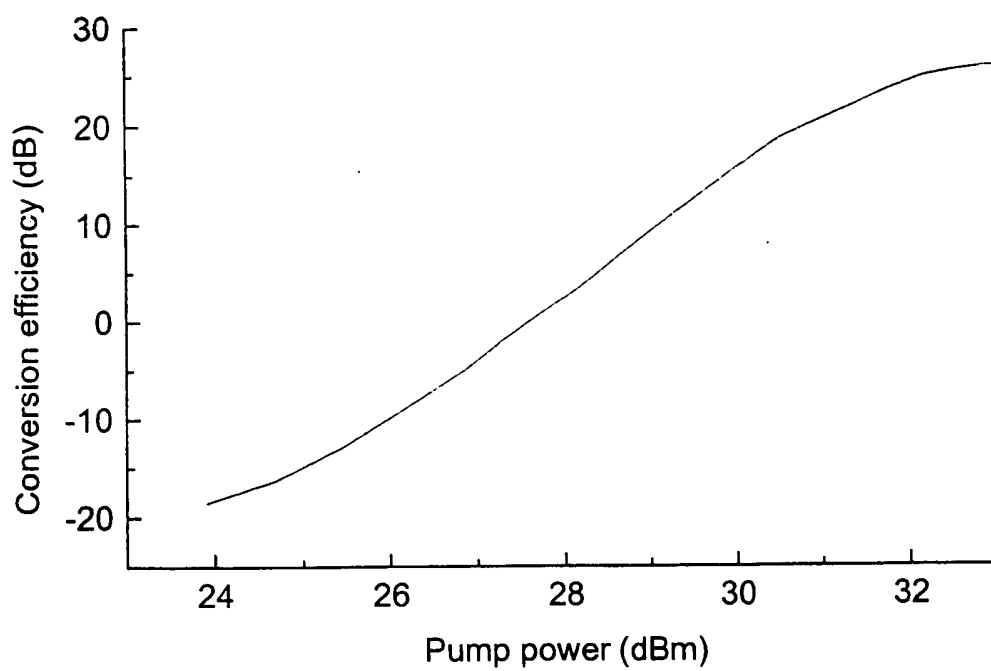Fig. 2. Schematic diagram for 3R regeneration

Fig. 3. The parametric conversion efficiency as a function of the peak pump power shows the exponential relationship with moderate pump condition.
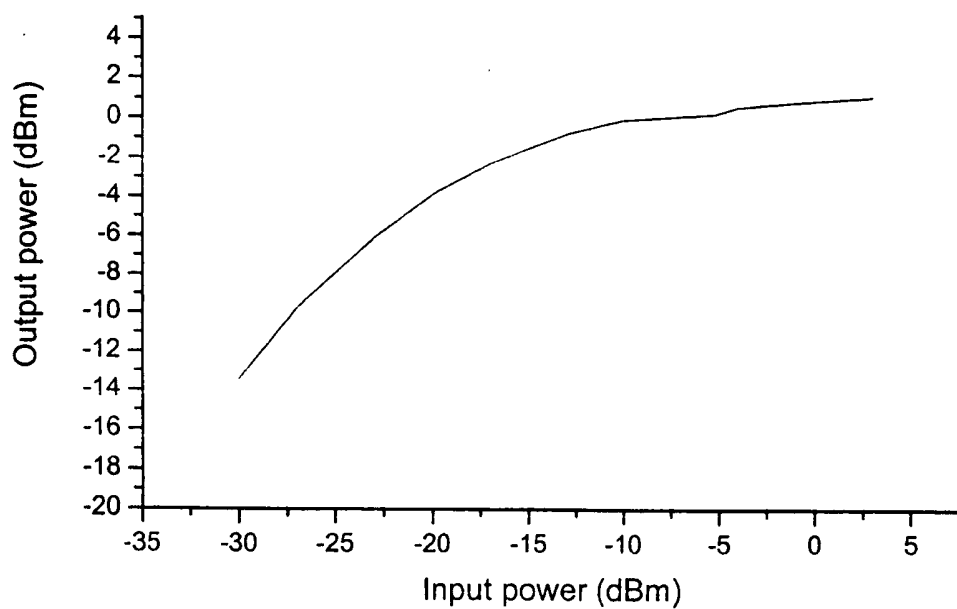
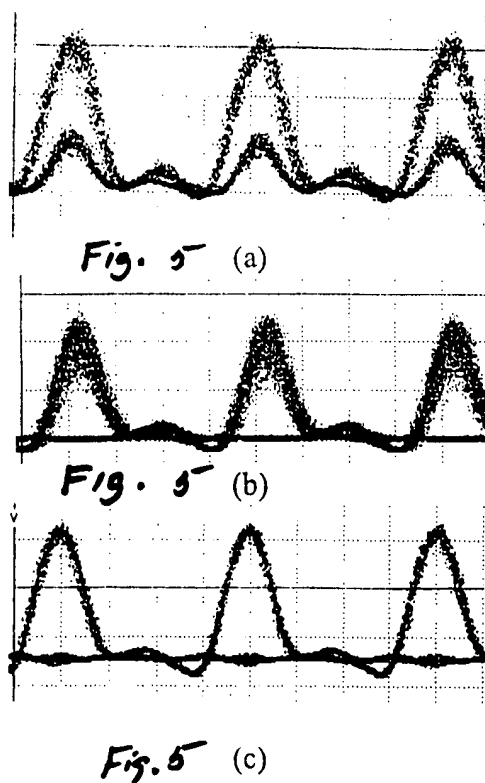Fig. 4. The output vs. input power relationship of SOA at saturation state

Fig. 5. Eye diagrams at 5 Gb/s for (a) Extinction ratio seriously degraded signal, (b) idler signal after parametric amplification by a DSF, (c) final regenerated signal. The horizontal scale is 50 ps/div and the vertical scale is 200 mV/div. The extinction ratios are 4.5 dB, 18 dB, 15.4 dB respectively.
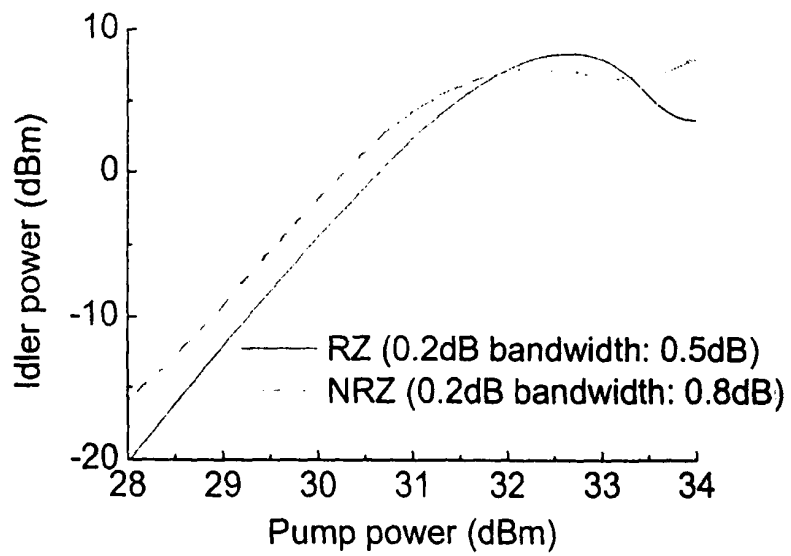
Fig. 6. Simultaneous exponential amplification and limiting amplification with a piece of fiber
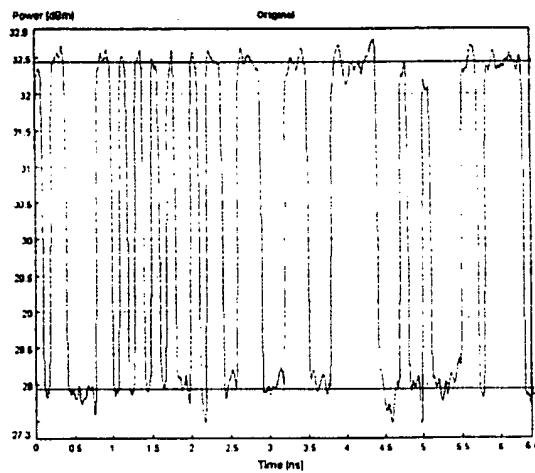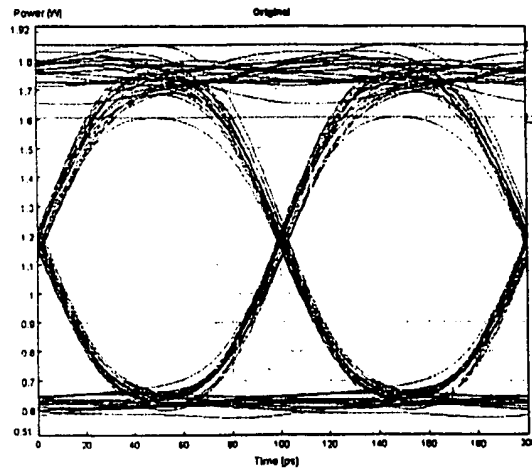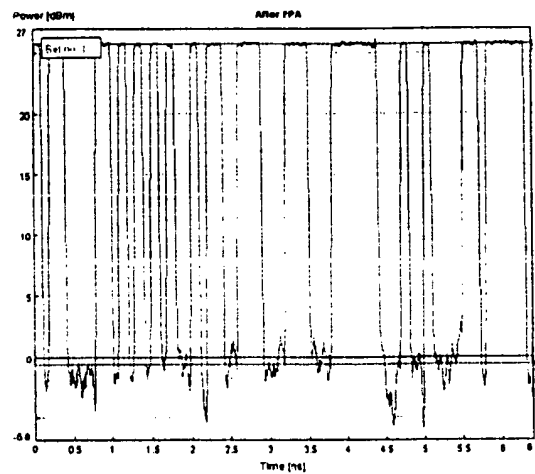
Fig. 7a

Fig. 7b

Original: 4.5 dB ER, 14% fluctuation at bit 1's

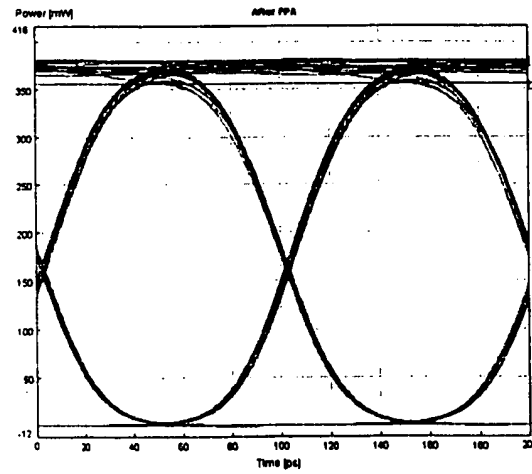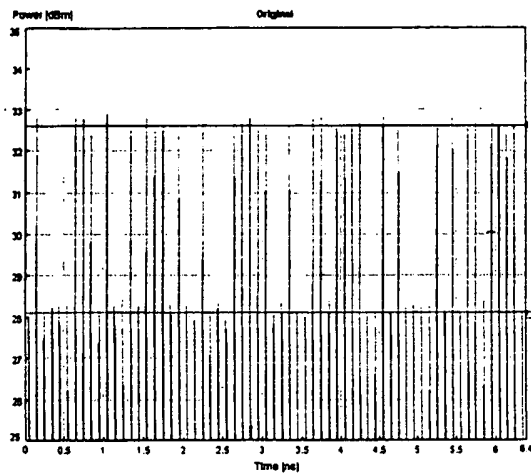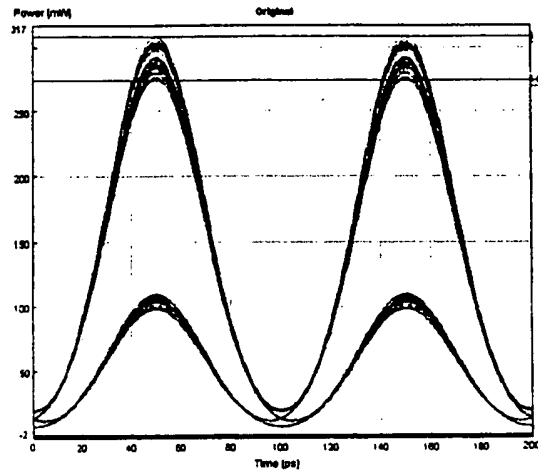Regenerated: 26 dB ER, 6% fluctuation at bit 1's

Fig. 7c

Fig. 7d

Fig 8a

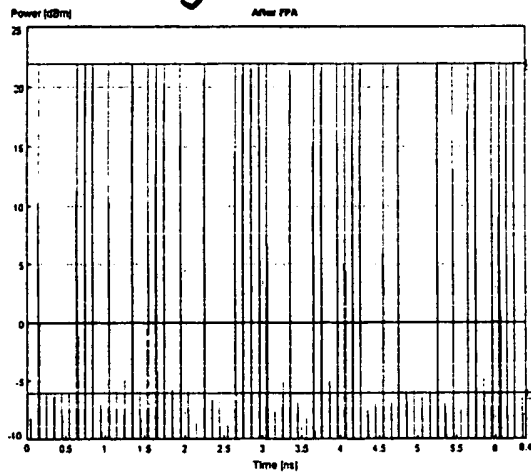Original: 4.5 dB ER, 11% fluctuation at bit 1's

Fig . 8b
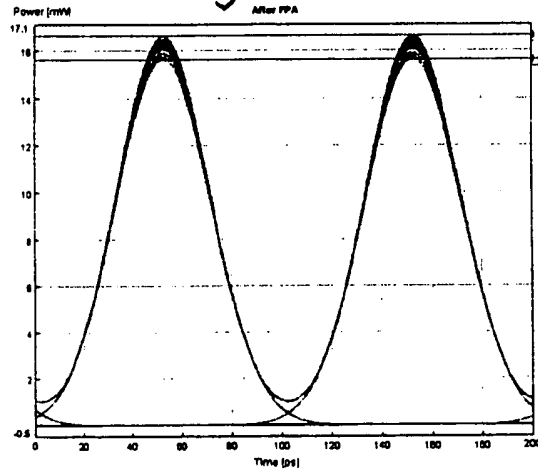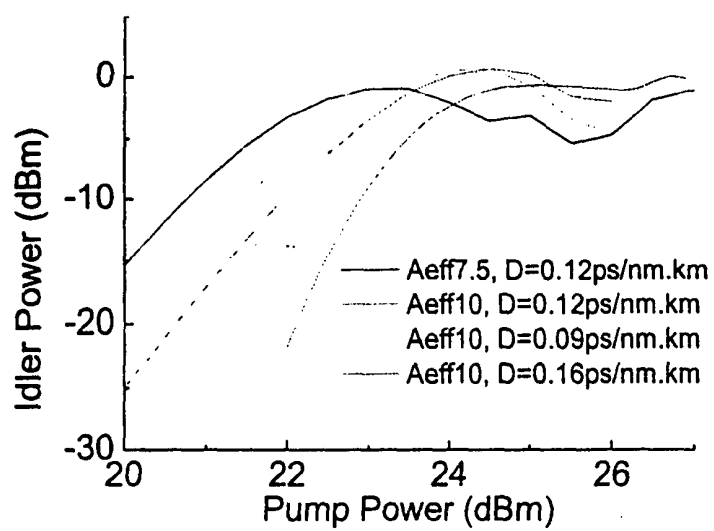

Fig.8c

Regenerated: 28 dB ER, 6% fluctuation at bit 1's

Fig. 8d

Fig. 8. 2R regeneration for 10 Gb/s RZ data

Fig. 9

Top fluctuation 24.1% → 5.5% @ Aeff10, D=0.16 ps/nm.km
Fig. 9. Sensitivity improved by using photonic crystal fiber.

92

94

96

109

Degraded Data

102

MFL λP — PC — MZI — SOA — BPF₁ — EDFA — power meter

98

100

Clock   Data

Pattern generator

93

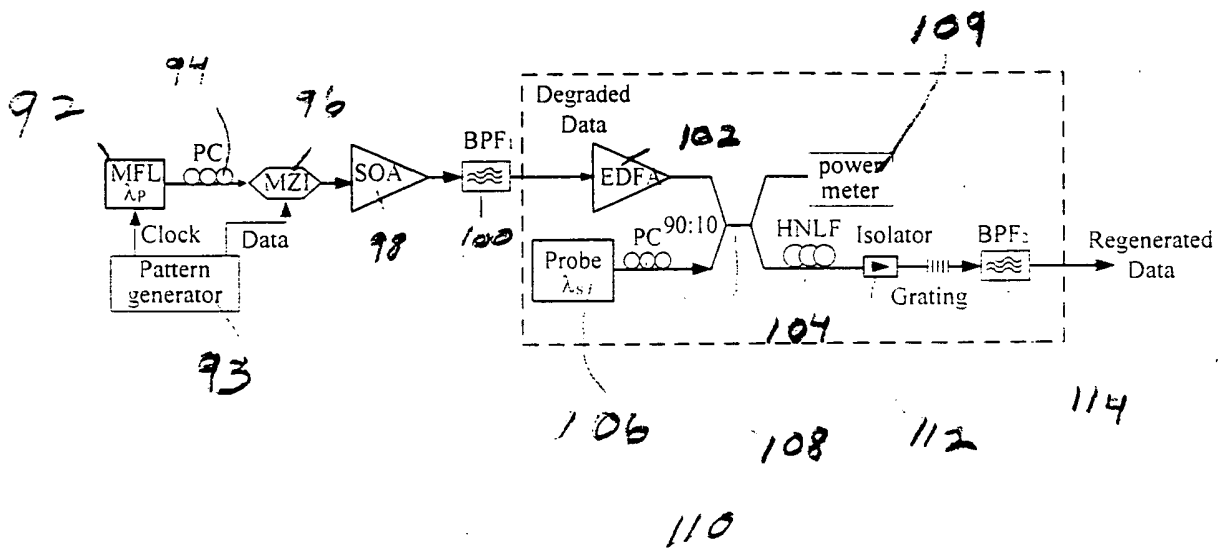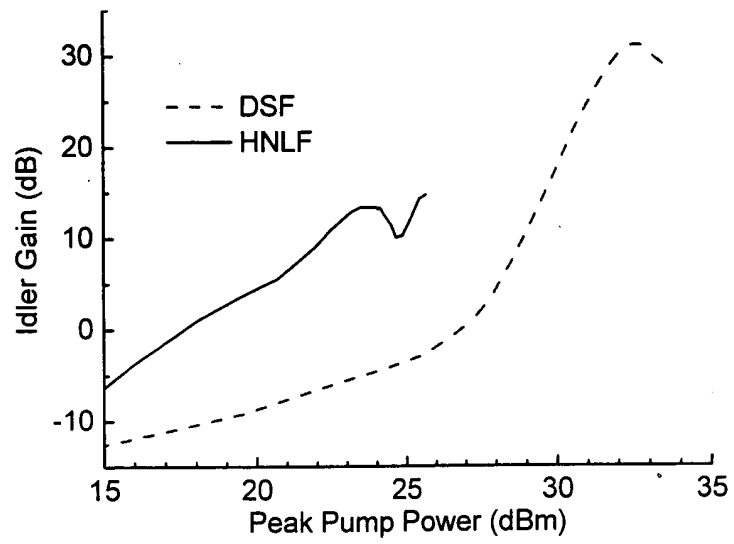Probe λsᵢ — PC 90:10 — HNLF — Isolator — Grating — BPF₂ — Regenerated Data
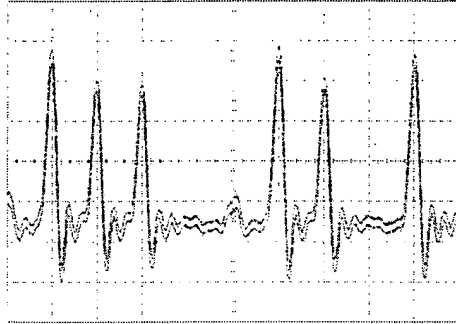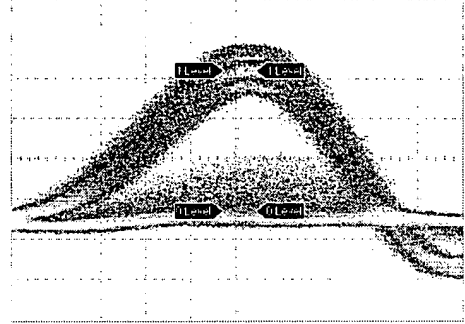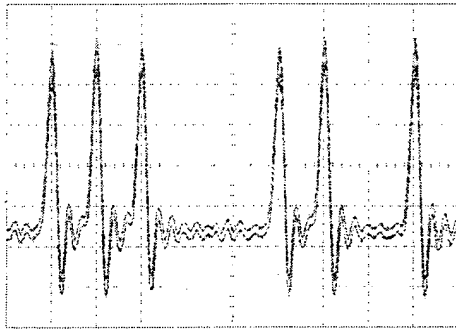
104

106   108   112   114

110

F,g. 10

Fig. 11

Fig. 12 (a)

Fig. 12 (b)

Fig 12 (c)

Fig. 12 (d)

Fig. 13